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(54) Apparatus and method for measuring volumetric flow of a liquid.

(57) Apparatus for measuring volumetric flow of a liquid in a vessel having a wall and having an axis extending longitudinally of the vessel parallel to the vessel wall comprises a flexible catheter (12) adapted to be disposed in the vessel. First and second ultrasonic transducers (T1, T2) are carried by the catheter on one side of the catheter and face the wall of the vessel so that the beams (B1, B2) from the transducers each cross the longitudinal axis of the vessel. The first transducer beam (B1) is inclined at an angle with respect to the longitudinal axis of the vessel. The second transducer beam (B2) is inclined in a direction which is generally perpendicular to the longitudinal axis of the vessel.

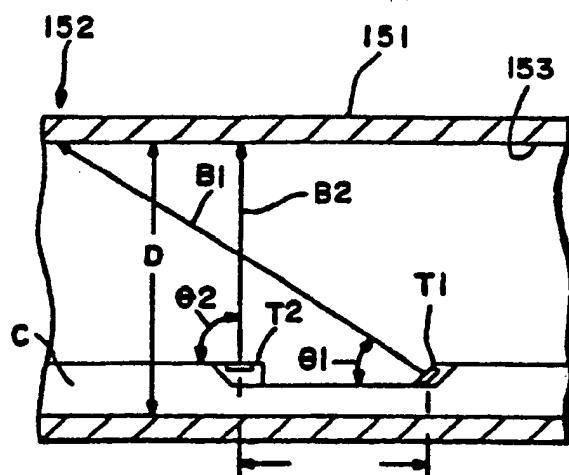


FIG.—3



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EUROPEAN SEARCH REPORT

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EP 89 31 0117

DOCUMENTS CONSIDERED TO BE RELEVANT		Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
Category	Citation of document with indication, where appropriate, of relevant passages		
Y	IEEE TRANSACTIONS ON SONICS AND ULTRASONICS vol. SU-27, no. 6, November 1980, pages 277-286, New York, US; R.W. MARTIN et al.: "An Ultrasonic Catheter for Intravascular Measurement of Blood Flow: Technical Details" * abstract; page 277, left-hand column, line 1 - page 278, left-hand column, line 27; figure 1 *	1,2,17	A 61 B 8/06 G 01 B 17/00 G 01 F 1/66
A	idem	9	
Y	--- EP-A-0 270 733 (APPLIED BIOMETRICS, INC.) * abstract; page 10, line 30 - page 16, line 28, Figures 1-6 *	1,2,17	
A	---	5,8,12	
A	EP-A-0 234 951 (CARDIOVASCULAR IMAGING SYSTEMS) * abstract; page 10, line 25 - page 11, line 29; figure 8 *	7	
A	--- PATENT ABSTRACTS OF JAPAN vol. 10, no. 9 (P-420)(2066), 14 January 1986; & JP - A - 60166821 (YOKOKAWA HOKUSHIN DENKI K.K.) 30.08.1985 * abstract; figure *	13,21	TECHNICAL FIELDS SEARCHED (Int. Cl.5) A 61 B 8/00 G 01 B 17/00 G 01 F 1/00
The present search report has been drawn up for all claims			
Place of search	Date of completion of the search	Examiner	
BERLIN	31-01-1991	WEIHS J.A.	
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone	T : theory or principle underlying the invention		
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